

[P055] Quantification of methylated amines in human body fluids: a versatile LC-MS method for nutrition studies

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Methylated amines in human body fluids (blood, urine) are of high interest in the context of nutrition, physiology and physical activity. Several compounds are discussed as potential biomarker of food consumption, including trigonelline for coffee, stachydrine for citrus fruits, TMAO (Trimethylamine-N-oxide) for fish, or methylhistidine isomers and dipeptides (anserine, carnosine) for meat. In addition, concentrations of certain amines are increased after heavy exercise, e.g. b-aminoisobutyric acid. For some compounds, for instance ADMA (asymmetric N,N-dimethylarginine) or TMAO, associations with the risk for CVD (cardiovascular diseases) have been shown. On basis of a previous LC-MS method for plasma TMAO and related compounds, we developed a new targeted UPLC-MS/MS method including 29 amines and amino acids in urine or plasma, mostly N-methylated compounds. After dilution and protein precipitation, analytes were separated by HILIC (hydrophilic interaction chromatography) and detected by positive ESI-MRM using time windows. The duty cycle is 9 minutes. Deuterated internal standards and matrix-matched standards were used for calibration. First validation results show good precision and recovery, and a broad linear working range for most compounds. Preliminary data from the KarMeN study (Karlsruhe Metabolomics and Nutrition) show weak associations of selected methylated amines with the consumption of certain food groups. The new method is efficient and allows quantification of a variety of amines in short times. It proved to be suited for application in nutrition-related research, e.g. for human cross-sectional or intervention studies.

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